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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,153	08/08/2001	Fumihiko Nakamura	09792909-5122	3081

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EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

an

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/925,153	NAKAMURA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	David S Blum	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) 6-12 and 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,13-16,18 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) 1,2,4-16 and 18-27 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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This action is in response to the appeal brief and certified translation papers filed 2/25/04.

### **DETAILED ACTION**

1. In view of the appeal brief and certified translation filed on 2/25/04, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below. The certified translation of document JP10-424586, Toshiyuki, shows that the English abstract was in error stating that the buffer layer is doped with cadmium. The translation shows that the layers adjacent the buffer layers are doped with cadmium.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4-5, 13-16, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruska (US005998232A) in view of Goetz (US006441393B2).

Maruska teaches the device of claims 1-2, 4-5, 13-16, and 18-19 except for explicitly teaching cadmium.

Maruska teaches a device (column 3 lines 25-26) having stack of layers including a GaN or AlN buffer layer (column 4 line 65) as in claims 5 and 19. The layer may be doped with p-type conductivity ions (column 5 lines 13-14). Maruska teaches as examples such p-type ions as beryllium, magnesium, calcium, carbon, and zinc (column 5 lines 13-15). These ions are taught as examples (such as) and are not taught as an exclusive list. Goetz teaches doping a GaN layer with p-type dopants such as magnesium, beryllium, zinc, and/or cadmium. Note that the two lists overlap in teaching magnesium, beryllium, and zinc.

Thus, using cadmium is well known in the art for p-type dopants in these (GaN, AlN) layers. The selection of a known material based on its suitability for its intended use supported a prime facie obviousness determination in *Sinclair and Carroll, Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945 "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle." 65 USPQ at 301).

Further, the instant specification teaches doping with a type IIB element (page 10) and teaches using cadmium (type IIB), magnesium (type IIA) or zinc (type IIB) (page 12),

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with no criticality taught between the element choices. Note that both Maruska and Goetz each teach the remaining two ions of the instant specification, zinc and magnesium.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or of any unexpected results arising there from. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in the claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1515, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

GaN is a group III-V compound and clearly a nitride compound (the N representing nitrogen). The metes and bounds of "heavily doped" in claims 1, 2, 13, and 16, is not defined in these claims and the teachings of Maruska are considered to teach "heavily doped".

Further, the p-type doping of Maruska is  $5 \times 10^{18}$  to  $1 \times 10^{20}/\text{cm}^3$  (column 7 lines 15-16), which is in the range of claims 4 and 18 (not less than  $1 \times 10^{17}/\text{cm}^3$ ), these claims setting the metes and bounds of "heavily doped".

The layer is used as isolation in LEDs or laser diodes (column 3 lines 26-27) as in claim 14.

An active layer is formed on the GaN layer (column 4 line 62-column 5 line 4) as in claim 15.

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It would be obvious to one skilled in the requisite art at the time of the invention to modify Maruska to include cadmium in the group of dopant ions as Goetz teaches cadmium to be a well-known p-type dopant.

***Response to Arguments***

4. Applicant's arguments, see the certified translation, filed 2/25/04, with respect to the rejection(s) of claim(s) 1-2, 4-5, 13-16, and 18-19 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Maruska in view of Goetz.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (757)-272-1687) and e-mail address is [David.blum@USPTO.gov](mailto:David.blum@USPTO.gov).

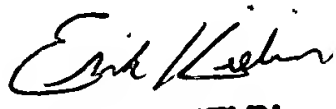
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (703) 872-9306. The facsimile number for customer service is (703)-872-9317.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David S. Blum

March 29, 2004

  
**ERIK J. KIELIN**  
**PRIMARY EXAMINER**